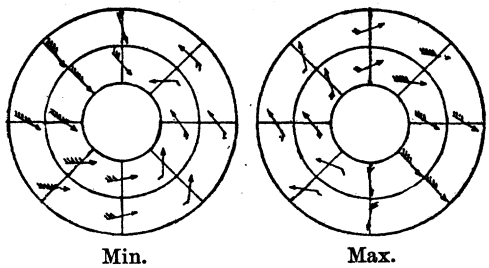
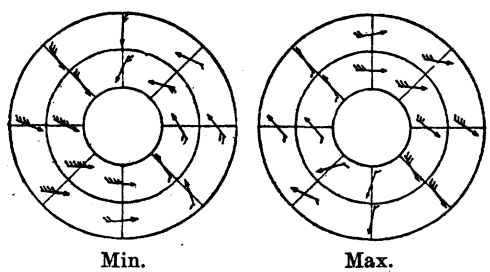


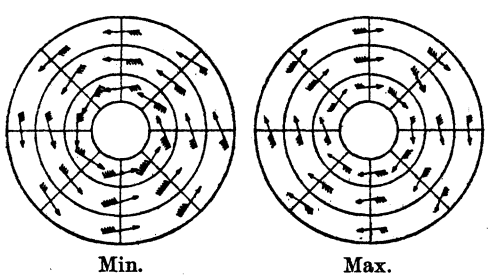
Min. Max.

Direction and Velocity of the Wind at Vienna. (Winter.)



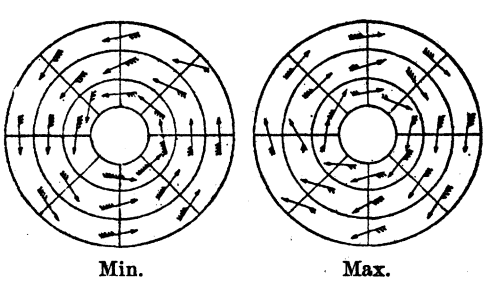
Min. Max.

Direction and Velocity of the Wind at Vienna. (Summer.)



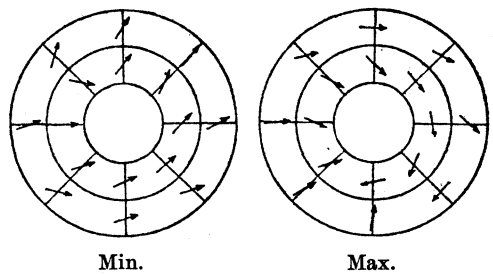
Min. Max.

Direction and Velocity of the Wind at Thorshavn. (Winter.)



Min. Max.

Direction and Velocity of the Wind at Thorshavn. (Summer.)



Min. Max.

Motions of Cirrus Clouds in Central Germany.

into a rather well marked right-handed whirl. It may be added that as far as the movement of the cirrus is concerned, it would suggest that inward baric gradients prevail aloft over cyclones and that outward gradients prevail over anticyclones, and that this is on the whole more favorable to the driven than to the convectional theory of atmospheric whirls in temperate latitudes.

W. M. DAVIS.

HARVARD UNIVERSITY.

SCIENTIFIC NOTES AND NEWS.

ASTRONOMY.

IN our issue of January 10th we called attention to Dr. See's announcement of a possible perturbation of the motion of the visible components of the binary star 70 Ophiuchi by an unseen companion. The *Astronomical Journal* of January 9th contains another article by Dr. See, in which he presents his views more at length and with much painstaking care. Yet after reading his elaborate paper, we cannot see that he has established anything more than a probability in favor of the existence of the supposed body. His strongest argument is, of course, the error of five degrees found by the American observers in Prof. Schur's ephemeris. But at the time of making his calculations Dr. See was unaware that nearly contemporaneous European observations were at variance with the American ones. If we take the mean of all the observations that have come to our knowledge we get a result in very fair accord with the ephemeris. Dr. See also bases a strong argument on the measures of distance, which were not used by Prof. Schur for the well-

known reason that all such distance measures are often affected with systematic errors. It is always a matter of personal opinion whether measures of distance should be used in computing the orbit of a binary like 70 Ophiuchi. In any case, the curve which Dr. See draws to illustrate the 'Perturbations in Distance' cannot be regarded as quite free from bias. Thus, if we divide the observations into three equal periods, we find:

Period.	Number of Points.	
	Above See's Curve.	Below See's Curve.
1830 to 1850,	15	5
1850 to 1870,	13	7
1870 to 1890,	2	18

It is evident that the curve needs raising at one end and lowering at the other; and if this is done, it will come near admitting of a satisfactory representation by means of a straight line. However this may be, we wish to repeat our former statement that this star is certainly worthy of close attention from double-star observers. Dr. See's research serves to emphasize this fact very strongly.

In the *Astronomical Journal* of January 23 Dr. S. C. Chandler publishes a paper on 'Standard systems of declination and proper motion,' in which he comes to the conclusion that "the system of the *Fundamental-Catalog*, admirable as it was for its original purpose, has now broken down, and the extension of its employment up to the present time, and certainly for the future, should cease." Dr. Chandler thinks that the proper system to use is that of Boss. To prove this he compares the declinations deduced by himself in a former paper from mural circle observations at Greenwich between the years 1825 and 1848 with the corresponding declinations from Boss' catalogue and from Auwers' *Fundamental-Catalog*. The agreement with Boss is much better than that with Auwers, especially after Boss has been corrected with a small term for latitude variation. We are unable to see in these facts a sufficient justification for Dr. Chandler's strong condemnation of Auwers' system. The essential requisite of a system of star places and proper motions is not that it shall differ from the truth at all epochs by the minimum amount. It is of no great consequence if the difference from the truth be somewhat large for some epochs, but it is essential that such difference shall always admit of being expressed as a function of the declination without discontinuity. We believe that the quantity of such discontinuity involved in the use of Auwers' system is less on the average than in the use of Boss'. Whether this be so or not is at present a matter of individual opinion, depending more or less upon the weight attached to Bradley's observations. But there is another practical essential of a star system which is not at all satisfied by Boss' system. We refer to the need of keeping the system up to date. This has been done very carefully by Auwers, but for Boss' system few of the later catalogues have been treated. Thus it is practically impossible for an astronomer who wants to deduce the best possible place of a star to employ the recent accurate catalogues, if he wishes the place referred to Boss' system. H. J.

CHEMISTRY.

Lobry de Bruyn has succeeded in preparing hydrazine or diamide, N_2H_4, in pure condition by treating the hydrochloric acid salt with sodium ethylate and distilling. The compound crystallizes at low temperatures, and can be boiled under the atmospheric pressure without decomposition. Attempts were made to prepare diimide, N_2H_2, by treating hydrazine with iodine, but these were without success.

Recent experiments by Gréhaut show that the effect of acetyline upon the animal system is very slight. If it unites with the hæmoglobin of the blood at all, the compound is very unstable, and not to be compared with the compound of hæmoglobin with carbonic oxide. This fact is of special interest in view of the probable extensive introduction of acetyline for illuminating purposes.

GENERAL.

At the meeting of the Paris Academy of Sciences on January 6th M. Marey was succeeded in the presidency by M. A. Cornu, and M. Chatin, the botanist, was elected Vice-President in the place of M. Cornu. At the meeting on January 13th M. Marcel Bertran was elected a member of the section of mineralogy, succeeding Pasteur.

THE Geological Society of London will this year award the following medals and funds: The Wollaston Medal to Professor E. Suess, the the Murchison Medal to Mr. T. Mellard Reade, the Lyell Medal to Mr. A. Smith Woodward, the proceeds of the Wollaston Fund and part of the Barlow-Jameson Fund to Mr. Alfred Harker, the proceeds of the Murchison Fund to Mr. Philip Lake, the proceeds of the Lyell Fund to Dr. W. F. Hume and Mr. W. C. Andrews, and the proceeds of the Barlow-Jameson Fund to Mr. Joseph Wright and Mr. John Storrie.

IT is reported in the daily papers that Prof. A. W. Wright and Prof. John Trowbridge have repeated Prof. Röntgen's experiments with the X-rays. A cablegram states that Prof. Mosetig, of the University of Vienna, has actually used the photography for diagnosis. The photographic pictures taken showed, with the greatest clearness and precision, the injuries caused by a revolver shot inthe left hand of a man and the position of the small projectile. In the other case, that of a girl, the position and nature of a malformation in the left foot were ascertained.

THE Bill for Adoption of the Metric System, introduced in the House of Representatives by Mr. Hurley (*not Harley*), to which reference was made in the last number of SCIENCE (January 31), has been considered by the Committee of Coinage Weights and Measures, and certain amendments have been suggested, to define more distinctly what is meant by the metric system, and to extend the time for the beginning of its general use to the first day of the next century.

MRS. ESTHER HERMANN has contributed $10,000 to the endowment of the New York Botanical Garden, making the total amount $260,000 in addition to plants of the value of $5,000 given by Mr. J. A. Pitcher.

THE Russian government is expected to introduce the Gregorian calendar in 1900. This may be done suddenly or by omitting the 29th of February in the first twelve leap years.

JOSEPH FIORELLI, an Italian antequarian and archæologist, died at Naples, on January 29th, at the age of 73.

THE catalogue of members of the American Institute of Electrical Engineers shows that on January 1st there were just 1,000 members, including two honqrary members, Lord Kelvin and Mr. W. H. Preece.

THE *Journal of the Royal Statistical Society* has published the report of the committee of the Berne International Statistical Institute recommending that a universal census be taken at the beginning of 1900. The dates of the census in different countries do not now coincide, but it would be a great advantage to secure uniformity of date and also of methods, and the committee hopes to accomplish this.

MR. J. Y. BUCHANAN contributes to *Nature* for January 9th an interesting account of the capture of a sperm whale off the Azores witnessed by the Prince of Monaco. The animal, when dying, ejected the bodies of huge cuttlefish which were secured, together with others subsequently found in the stomach. Owing to the absence of the heads it was impossible to positively identify them, but they probably represent a new species of *Histioteuthis* and of *Cucioteuthis*, and an entirely new genus and species to which the name of *Lepidoteuthis Grimaldii* is given by Prof Joubain. The largest cuttle-fish body was about two meters in length. Circular marks, believed to be the impression of suckers, were found on the head and body of the whale. This account corroborates the stories long told by whalemen who have always insisted that the sperm whale in his death agonies vomited up fragments of squids 'as big around as a barrel.'

AT a special meeting of the Chemical Society of London held recently, a memorial lecture on the 'Life and Work of the late Prof. von Helmholtz' was delivered by Prof. G. F. Fitzgerald, Trinity College, Dublin. It is perhaps not known to every one that Helmholtz was a great chemist as well as a great physicist, mathematician, physiologist and psychologist. He was a foreign member of the London Chemical Society, and in 1881 filled the office of Faraday Lecturer, when he communicated to the Society his famous memoir on the 'Connection between Electricity and Chemical Action.''

THE *Zoologischen Adressbuch*, already noted in this journal, gives 2,458 addresses of zoölogists

in the United States, 1,703 in Germany, 1,523 in France, and 1,469 in Great Britain and Ireland. This is a satisfactory indication of the interest taken in zoölogy in America, even though it may have happened that a larger percentage of collectors and amateurs are included in the case of the United States than in the cases of the other countries.

MR. C. E. BORCHGREVINK arrived in New York on February 2d, and will lecture in America.

ALFRED L. KENNEDY, metallurgist and geologist, was burned to death through a fire in his room on January 30th. He was about 80 years of age.

THE Montreal Branch of the British Medical Association have invited the Association to meet in Montreal this year. This invitation cannot be accepted as arrangements have already been made to meet in Carlisle, but it is probable that the Medical Association will before long follow the example of the British Association for the Advancement of Science and hold a meeting in Canada.

ACETYLENE gas seems hitherto to have been promoted chiefly with a view to selling stocks and franchises, though we understand the process is not covered by patents. It seems, however, probable that the gas will have important practical applications, which shows once more the practical importance often following chemical research. Acetylene gas is a hydrocarbon compound resulting when water is added to calcic carbon, which is made by fusing lime and carbon in an electric furnace. The only commercial acetylene is now made at Spray, N. C.; but it is reported that a furnace is being erected at Niagara Falls, and that large quantities of the gas will soon be manufactured. The advantages of the gas are its brilliant white light, ten to twenty times as great as coal gas, its portability and (it is claimed) its cheapness. It should be remembered, however, that it is poisonous, and, especially in certain compounds, explosive.

AN editorial article in the February number of *Appleton's Popular Science Monthly* on 'The Hundredth Anniversary of the French Institute' states that "As yet, the name of no citizen of the United States has been inscribed on the roll of the foreign associates of the Institute, although it is understood that in a recent election to fill the vacancy occasioned by the death of a member the name of Prof. Simon Newcomb, of Washington, lacked but a few votes of receiving this honor." Prof. Newcomb was elected an associate member on the 17th of June of last year, succeeding von Helmholtz, as announced at the time in this journal. The name of Prof. H. A. Rowland should be added to the list of American correspondents given in *Appleton's Popular Science Monthly*. The six American correspondents are: Asaph Hall, B. A. Gould, S. P. Langley, H. A. Rowland, James Hall and A. Agassiz.

JOHN WILEY & SONS announce for July next a volume on *Higher Mathematics for Engineering Colleges*, edited by Prof. Mansfield Merriman and Prof. R. S. Woodward. The work is intended primarily for the use of Junior and Senior Classes in schools of engineering, and contains a concise treatment of subjects not commonly found in text-books, but upon which lectures are now given in the best classical and technical institutions. In addition to chapters by the editors on the Solution of Equations, and Probabilities and Theory of Errors, the work will contain the following chapters: Prof. W. E. Byerly, of Harvard University, Harmonic Functions; Prof. T. S. Fiske, of Columbia College, General Theory of Functions; Prof. G. B. Halsted, of University of Texas, Projective Geometry; Prof. E. W. Hyde, of University of Cincinnati, Point Analysis and Ausdehnungslehre; Prof. W. W. Johnson, of U. S. Naval Academy, Differential Equations; Prof. A. Macfarlane, of Lehigh University, Vector Analysis and Quaternions; Prof. J. McMahon, of Cornell University, Hyperbolic Trigonometry; Prof. F. Morley, of Haverford College, Elliptic Integrals and Functions; Prof. D. E. Smith, of Michigan Normal School, History of Modern Mathematics; Prof. L. G. Weld, of University of Iowa, Determinants.

MACMILLAN & Co. announce a work on 'Social Interpretations of the Principles of Mental Development,' by Prof. J. Mark Baldwin, of

Princeton, and 'An Outline of Psychology,' by Prof. E. B. Titchener, of Cornell University.

DR. DONALDSON SMITH gave before the Royal Institution, London, on January 20th, an account of his expedition to Lake Rudolf, in northeastern Africa. It was found that the Nianann is the only river emptying into the lake, and that there is no river Bass, as supposed by Count Teleki. Seven hundred birds were collected, and of these 24 have been described by Dr. Bowdler Sharpe as being new to science. The different species of insects numbered 3,000, and besides these there were many plants, butterflies and mammals collected.

A HEARING was given on January 30th by the Commissioners of the District of Columbia upon a Senate bill which would prevent vivisection in the District. Dr. Busey and Surgeon General Sternberg spoke against the bill.

MEMBERS of the Gypsy Moth Commission of the Massachusetts State Board of Agriculture appeared before the Committee of Agriculture and argued in favor of the passage of an appropriation of $200,000 for the work of exterminating the gypsy moth. It was stated by director E. H. Forbush that 425 men would be needed during the spring and summer; it is proposed to burn over infested waste lands which is done by means of a machine which throws out a spray of oil which burns so rapidly that the eggs and caterpillars are destroyed without injury to the trees, then the trees are burlapped and examined, and eggs laid during the season are so far as possible destroyed. Roads would be examined with special care to prevent caterpillars from dropping on passing teams and being thus carried to uninfested localities.

UNIVERSITY AND EDUCATIONAL NEWS.

AT a meeting of the convocation of the University of London on January 21st a resolution was passed, 460 votes being in its favor and 240 against it, favoring what is known as the Cowper Commission Scheme for the consolidation and reconstruction, of the examining and teaching institutions of London. It should be remembered that the University of London does not give instruction, but only grants degrees on examination, whereas there are also in London two or more colleges which give instruction but do not grant degrees. It is universally admitted that some reform is needed, either that the teaching institutions should be consolidated and permitted to confer degrees on their students, while the University of London remains purely an examining body, or that all the institutions should be united. As appears from the above vote, the members of the convocation of the University of London attending the meeting favored the latter plan, but it is claimed that it would not have the approval of a majority of all the graduates.

A PUBLIC meeting has been held in Albany urging the removal of Union University from Schenectady to that city, and it is understood that the matter will be seriously considered by the trustees.

MR. JOSEPH BANNIGAN has given $4,000 to the Catholic University of America, and has made known his intention to donate for twelve years $4,000 a year for library purposes.

BY the will of the late Mrs. Doyon, the University of Wisconsin has received $5,000, the income of which is to be devoted to scholarships for young women.

TWO scholarships of $2,000 each have been presented to Tufts College, one by Mrs. A. B. Perkins and the other by J. S. and H. N. White.

DR. L. TRENCHARD MORE, of St. Louis, Mo., has become an assistant in physics at the Worcester Polytechnic Institute.

DISCUSSION AND CORRESPONDENCE.

THE INVERTED IMAGE ON THE RETINA.

EDITOR OF SCIENCE: Prof. Brooks can hardly hope that there should be any consensus among scientific men in regard to the difficult question whether we know or do not know whether the lower animals have or have not consciousness, if there are still distinguished scientists who think that there is anything which needs explanation in the fact that the image on the retina is inverted, or that the question will continue to be a subject for discussion for centuries yet to come. As long as we do not *feel* that the image on the retina is inverted, as long as we are not aware in consciousness that